Space Weather Forecast

Issued on Sunday 19 January 2025 at 12:03 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares expected with slight chance of X-class (Strong) flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate during the last 24 hours with an isolated Moderate-class flare from a moderately large region in the northwest. This is the most active of the eight regions currently on the disc, but has recently seen activity ease with the weakening of its mixed magnetic polarity intermediate spot, although some further slow growth is observed in its intermediate portion. Other regions of interest include the largest region on the disc, in the southeast, however this has remained relatively inactive despite ongoing slow growth and the persistence of a small mixed polarity spot. A further region in the north-centre disc is also of interest, dominated by a single unipolar large spot, however has remained inactive through this period, although this too has shown some recent slow growth in its trailing portion.

A pair of weak coronal mass ejections (CMEs) were observed leaving the Sun associated with a Moderate-flare on 18 Jan. These have been assessed as likely missing Earth, but with a slight chance of a glancing impact late on day 2 (20 Jan).

Solar Wind / Geomagnetic Activity: Ongoing fast winds from a coronal hole were observed. Solar wind speed has tended to ease slowly but erratically from elevated (around 500km/s) to slightly elevated (around 460km/s). Interplanetary Magnetic field was Weak, with the north-south component also Weak and variable in direction, although a more extended period of southward orientation was observed from 19/0300UTC . Geomagnetic activity was mostly Quiet (Kp 1-2), but with an Unsettled (Kp 3) interval 19/0600-0900UTC, as observed by BGS.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected, with isolated Moderate-class flares. There is a slight chance of Strong-class flares. These are most likely from the larger regions in the northwest and southeast.

Solar Wind / Geomagnetic Activity: There are no CME arrivals expected at Earth, however a glancing impact from the CME early on 18 Jan cannot be completely ruled out late on day 2 (20

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Jan). Otherwise, current coronal hole sourced fast solar winds are expected to persist day 1-2 (19-20 Jan), before gradually easing day 3 (21 Jan) onward. Mainly Quiet geomagnetic activity is expected, with Unsettled intervals and a slight chance of Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background with no Solar Radiation Storms occurring. However, there is a slight chance of this rising in response to any significant flares that occur.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	75	70
Very Active	R3-R5 (X Class)	No	20	20	15	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	20	20	20	20
Very Active	**≥ S3 ***	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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